PB83-111013

Recognizing Farmers' Attitudes and Implementing Nonpoint Source Pollution Control Policies

Illinois Univ. at Urbana-Champaign

Prepared for

Environmental Research Lab.
Athens, GA

Jun 82

U.S. Department of Commerce
National Technical Information Service
NTIS

TYPING GUIDE SHEET

BEGIN FIRST LINE OF TEXT HERE

CENTER OF PAGE

TOP OF IMAGE AREA

PB83-111013

EPA-600/5-82-004
June 1982

DROPPED HEAD: BEGIN SECTIONS HERE

RECOGNIZING FARMERS' ATTITUDES AND IMPLEMENTING NONPOINT SOURCE POLLUTION CONTROL POLICIES

by

W. D. Seitz
D. M. Gardner
J. C. van Es
University of Illinois
Urbana, Illinois 61801

6-1/2"

9-1/8"

Contract Number 68-03-2597

Project Officer

Thomas E. Waddell
Technology Development and Applications Branch
Environmental Research Laboratory
Athens, Georgia 30613

REPRODUCED BY
NATIONAL TECHNICAL INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

ENVIRONMENTAL RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
ATHENS, GEORGIA 30613

BEGIN LAST LINE OF TEXT

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

3/8"

PAGE NUMBER

EPA-287 (Cin.)
(4-76)

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/5-82-004	ORD Report	PB83 111013

4. TITLE AND SUBTITLE	5. REPORT DATE
Recognizing Farmers' Attitudes and Implementing Nonpoint Source Pollution Control Policies	June 1982
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
W.D. Seitz, D.M. Gardner and J.C. van Es	
9. PERFORMING ORGANIZATION NAME AND ADDRESS University of Illinois at Urbana-Champaign Urbana IL 61801	10. PROGRAM ELEMENT NO. CARB1A
	11. CONTRACT/GRANT NO. 68-03-2597
12. SPONSORING AGENCY NAME AND ADDRESS Environmental Research Laboratory--Athens GA Office of Research and Development U.S. Environmental Protection Agency Athens GA 30613	13. TYPE OF REPORT AND PERIOD COVERED Final, 9/77-8/79
	14. SPONSORING AGENCY CODE EPA/600/01

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This report examines the role of farmer attitudes and corresponding communication activities in the implementation of nonpoint source water pollution control programs. The report begins with an examination of the basis for and function of attitudes in influencing behavior. The role of the process of communication in changing attitudes and influencing behavior is examined in considerable detail. The appropriate uses of interpersonal and mass communications in the implementation of public programs aimed at farmers is indicated.

The report also includes a discussion of several means of improving implementation procedures. These include incentive programs, modified ditizen participation procedures, and a comprehensive communication program. The report is based on a review of thc available literture on attitudes, communication processes, citizen participation, and participation in other federal programs.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	40
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

NOTICE

This document has been reviewed in accordance with U.S. Environmental Protection Agency policy and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

BEGIN FIRST LINE OF TEXT HERE

CENTER OF PAGE

TOP OF IMAGE AREA

DROPPED HEAD; BEGIN SECTIONS HERE

FOREWORD

As environmental controls become more costly to implement and the penalties of judgment errors become more severe, environmental quality management requires more efficient management tools based on greater knowledge of the environmental phenomena to be managed. As part of this Laboratory's research on the occurrence, movement, transformation, impact and control of environmental contaminants, the Technology Development and Applications Branch develops management and engineering tools to help pollution control officials achieve water quality goals through watershed management.

Agricultural sources contribute significantly to water pollution problems in many areas of the United States. This report describes part of a 2-year study in which the social, economic, legal and institutional issues involved in the management and control of pollutants from agricultural nonpoint sources were examined.

9-1/8"

David W. Duttweiler
Director
Environmental Research Laboratory
Athens, Georgia

BEGIN LAST LINE OF TEXT

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

3/8"

PAGE NUMBER

EPA Form 2350-4 (4-80)
(PREVIOUSLY CIN. EPA FORM 287)

☆ U.S. GOVERNMENT PRINTING OFFICE 1981—758-923

TYPING GUIDE SHEET

BEGIN FIRST LINE OF TEXT HERE

TYPING GUIDE SHEET

CENTER OF PAGE

TOP OF IMAGE AREA

DROPPED HEAD; BEGIN SECTIONS HERE

ABSTRACT

This report examines the role of farmer attitudes and corresponding communication activities in the implementation of nonpoint source water pollution control programs. The report begins with an examination of the basis for and function of attitudes in influencing bahavior. The role of the process of communication in changing attitudes and influencing behavior is examined in considerable detail. The appropriate uses of interpersonal and mass communications in the implementation of public programs aimed at farmers is indicated.

The report also includes a discussion of several means of improving implementation procedures. These include incentive programs, modified citizen participation procedures, and a comprehensive communication program. The report is based on a review of the available literature on attitudes, communication processes, citizen participation, and participation in other federal programs.

This report was submitted in partial fulfillment of Contract No. 68-03-2597 by the Institute for Environmental Studies, University of Illinois, Urbana-Champaign. The work was conducted with the cooperation of the Illinois Agricultural Experiment Station and College of Commerce. This report covers the period September 1977 to August 1979.

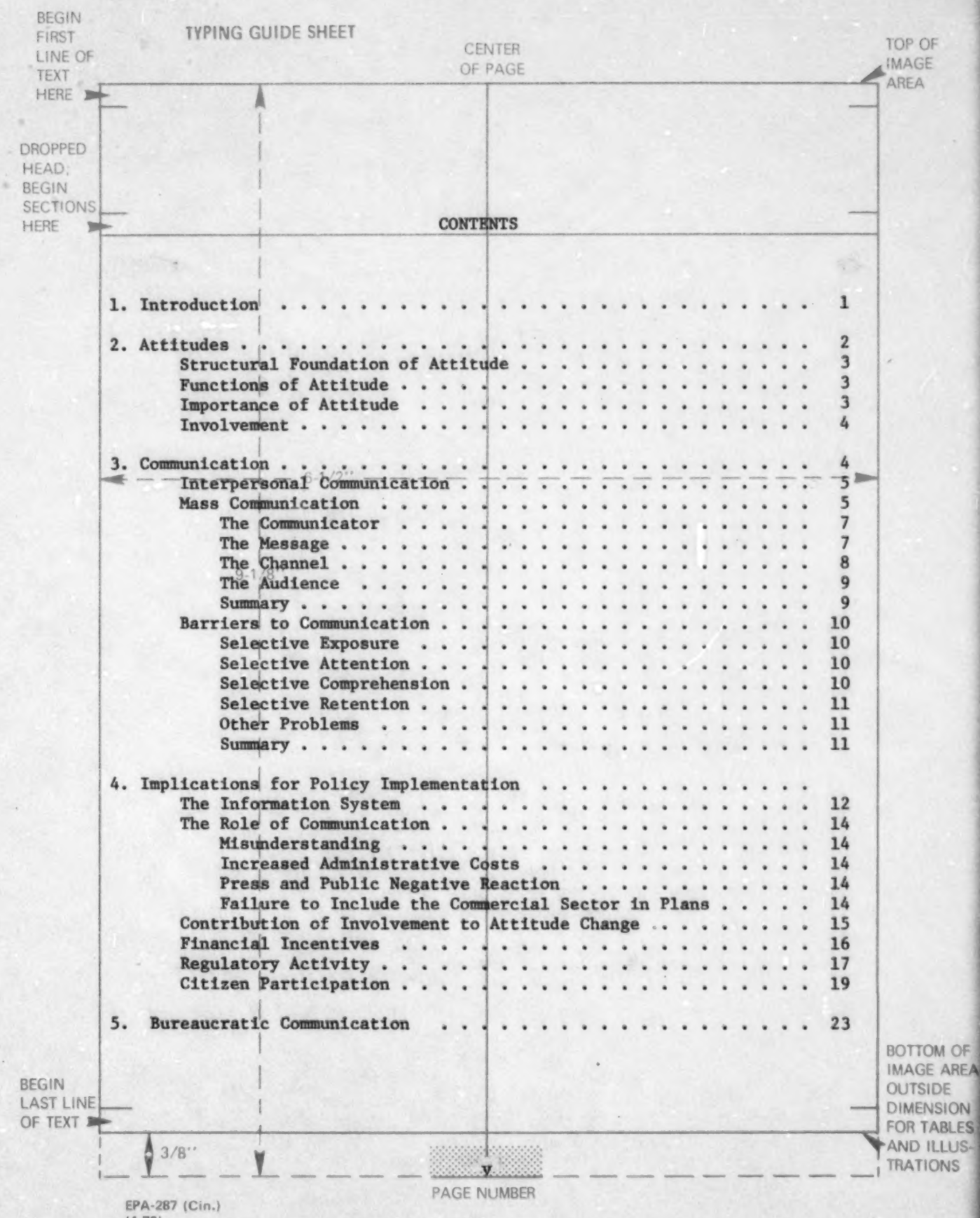
BEGIN LAST LINE OF TEXT

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

3/8"

PAGE NUMBER

EPA-287 (Cin.)
(4-76)


TYPING GUIDE SHEET
BEGIN FIRST LINE OF TEXT HERE
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
CONTENTS
1. Introduction 1
2. Attitudes 2
Structural Foundation of Attitude 3
Functions of Attitude 3
Importance of Attitude 3
Involvement 4
3. Communication 4
6 1/2"
Interpersonal Communication 5
Mass Communication 5
The Communicator 7
The Message 7
The Channel 8
9 1/8"
The Audience 9
Summary 9
Barriers to Communication 10
Selective Exposure 10
Selective Attention 10
Selective Comprehension 10
Selective Retention 11
Other Problems 11
Summary 11
4. Implications for Policy Implementation . . . . . .
The Information System 12
The Role of Communication 14
Misunderstanding 14
Increased Administrative Costs 14
Press and Public Negative Reaction 14
Failure to Include the Commercial Sector in Plans 14
Contribution of Involvement to Attitude Change 15
Financial Incentives 16
Regulatory Activity 17
Citizen Participation 19
5. Bureaucratic Communication 23
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
v
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

CONTENTS (cont.)

6. Some Suggestions for Implementation 25
Educational Program 25
Restructuring Agency-Citizen Interaction 26
Farmer Incentives 27
Target Dates 27

References 28

FIGURES

1. Interpersonal communication 6

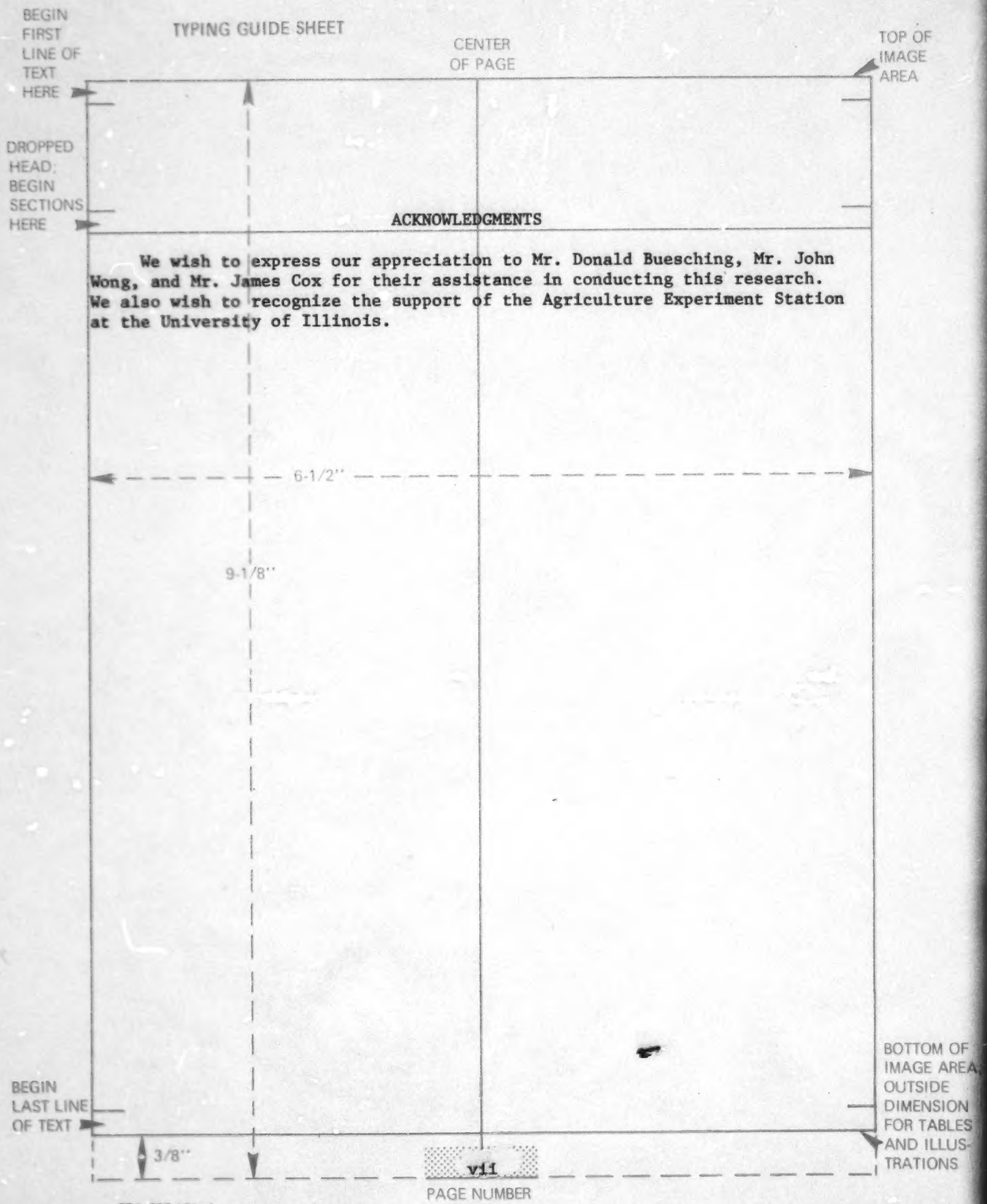
2. Mass communication 6

3. The information system 13

4. The dynamics of official-client communication 24A

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

PAGE NUMBER
EPA-287 (Cin.)
(4-76)


BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
ACKNOWLEDGMENTS
We wish to express our appreciation to Mr. Donald Buesching, Mr. John Wong, and Mr. James Cox for their assistance in conducting this research. We also wish to recognize the support of the Agriculture Experiment Station at the University of Illinois.
6-1/2"
9-1/8"
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
vii
PAGE NUMBER
EPA-287 (Cin.) (4-76)

BEGIN FIRST LINE OF TEXT HERE

TYPING GUIDE SHEET

CENTER OF PAGE

TOP OF IMAGE AREA

DROPPED HEAD; BEGIN SECTIONS HERE

Section 1. INTRODUCTION

Nonpoint source (NPS) pollution can derive from a number of human activities such as mining, construction, and cropping. Our concern in this report will be that portion of NPS pollution attributable to agriculture. Furthermore, while we recognize that agriculture contributes a number of pollutants such as pesticides and plant nutrients, our frame of reference will be sheet and rill erosion from cropland, and its implication for in-stream water quality.

Recent estimates point to sedimentation, and particularly sedimentation from agriculture, as an important contributor to NPS pollution. By volume, sediment ranks as the greatest water pollutant and 50 percent of the sediment deposited in streams and lakes comes from cropland (GAO, 1977). In Illinois, sheet and rill erosion from cropland accounts for 120.3 million of the State's annual erosion total of 181.4 million tons (Illinois Agriculture Task Force, 1978). Finally, since other major agricultural pollutants such as pesticides and plant nutrients may move with soil particles, the adoption of erosion control would generally alleviate other water quality problems.

Introducing remedial policies into agriculture has proved to be quite complex. Because farmers are the principal decision makers regarding on-the-farm activities, the success of most programs, whether voluntary or mandatory, depends upon their participation. Voluntary participation is preferable in many respects because it maintains a farmer's control over his affairs, allows for local decisions, and encourages adaptations to local conditions.

Certain information is known about the nature of a voluntary compliance system. The Cooperative Extension Service has an excellent record of achieving change in agriculture through voluntary programs. Much of Extension's work, however, has focused on educational activities compatible with the profit maximization efforts of most farmers. While much of the technology introduced to farmers in the past has helped them to increase their productivity, pollution-control policies may require activities that are to improve public welfare and yet may not be profitable to the farmer (Pampel and van Es, 1977).

Policies that are based on mandatory participation can involve significant interference with farm operations. However, the gravity of the NPS problem and/or the necessity to bring critical acreage in an area under a pollution-control program may lead policy makers to decide that mandatory participation is called for. The drawbacks of mandatory programs, however, are well known. They tend to be accompanied by cumbersome administrative machinery that may be both costly and annoying to those

BEGIN LAST LINE OF TEXT

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

3/8"

PAGE NUMBER

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

affected by the regulations. Also, poor communications and misunderstandings between the regulatory agency and those regulated are a familiar part of most scenarios. Mandatory regulations are usually created by a central authority, frequently causing inequities and inefficiencies. Agriculture may be particularly vulnerable to such inequities because its needs are more sensitive to local conditions than in almost any other sphere in which activity is regulated.

Farmers place a high value on exercising their autonomy in farm decision making and on unrestricted property rights. Farmers have, however, accepted regulatory activity interfering with their decision-making autonomy in such areas as grading standards for farm products, milk-marketing orders, and many public-health regulations. While they have not necessarily cherished these regulations, there is little evidence that noncompliance has been widespread once the regulations have been introduced, probably because the farmers were persuaded that the regulations were justified. Their attitude toward the regulations, then, was important in securing their cooperation.

We will therefore begin this report with a discussion of attitudes--how they are formulated and changed and how they influence behavior. We will then examine the process of communication as it influences individuals' behavior by modifying what they know or how they feel. This section will be developed in considerable detail because we believe that the proper use of communication and educational programs will be crucial to the successful implementation of NPS pollution-control programs. We will then examine methods of achieving better implementation, such as the development of better communication, incentive programs, and citizen participation.

Section 2

ATTITUDES

An attitude is a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object (Fishbein and Ajzen, 1975). The formation of attitudes within an individual is a complicated process. Krech, Crutchfield and Ballachey (1962) noted that as individuals develop, their knowledge, feelings, and action tendencies with respect to the various subjects in their world become organized into enduring systems called *attitudes*. For example, an individual will have an attitude toward a local government that may be different from his attitude toward the federal government. These attitudes can generate different sets of behavior toward the two governing bodies. If we want to change that behavior, often we should start by changing his attitudes. In addition, there is a growing volume of data supporting the viewpoint that a knowledge of attitudes can also be used to predict behavior. Therefore, to better understand the nature of attitudes and how they may be changed, it is important to consider the structural foundation of attitudes, the functions they serve, and their importance to the individual. In this report we will also use the term *value*, which reflects, in general, a cluster of attitudes that may, for example, be expressed by placing a high value on the feeedom to make farming decisions.

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD: BEGIN SECTIONS HERE

Structural Foundation of Attitude

Attitudes are generally specified in terms of their three parts: knowledge (cognitive), feeling (affective), and action tendency, which are seen as interdependent. The cognitive component refers to the beliefs the individual holds about a subject such as a physical object, an institution, or a governmental policy, e.g., chisel plows, the Soil Conservation Service, and the Rural Environmental Assistance Program. It includes the knowledge and evaluative beliefs that attribute qualities to the subject such as good or bad, favorable or unfavorable. The affective component refers to the individual's feelings concerning the subject, such as like or dislike, pleasure or displeasure. Action tendency refers to the individual's readiness to behave overtly toward the subject.

One attitude generally does not exist in isolation from other attitudes. Attitude components tend to cluster and form the person's total attitude/value system. For example, a farmer may have a favorable attitude about soil conservation as well as an unfavorable attitude toward the government. When the government tries to establish rules to regulate soil erosion, the farmer may not react favorably because of various components within his attitudinal structure as well as his combination of attitudes.

Functions of Attitude

An attitude also serves an individual's needs. That is to say, an attitude can help an individual reach his desired goal, protect his ego, give positive expression to his self-concept, and provide structure and standards through which he acquires knowledge. Through these functions and by holding certain attitudes, a farmer can maintain self-esteem, express views, or organize additional knowledge concerning farm practice in the community.

Importance of Attitude

Although the individual may hold attitudes on several topics, not all of these attitudes are important (have general salience). The importance (specific salience) of an attitude will vary with circumstances. The salience of an attitude is an important variable in Rokeach's (1968) model of attitude change. He defines attitudes as an organization of beliefs. He hypothesizes the structure of an individual belief system as follows:

1. Not all beliefs are equally important to the individual. They vary along a central-peripheral dimension and are functionally distinct.

2. The more central a belief, the more it will resist change.

3. Change in central beliefs will produce greater changes in the less-central beliefs.

He also distinguishes between attitude toward subjects and attitude toward situations. To say that an individual has an attitude toward a particular subject does not mean that this attitude will be activated across all situations. Thus, having a generally liberal attitude toward civil rights,

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA

for example, does not necessarily activate liberal behavior concerning integrated housing or integrated schools. Having a negative attitude toward the federal government does not necessarily preclude participation in all government programs.

DROPPED HEAD; BEGIN SECTIONS HERE

The knowledge aspect of attitude formation is discussed elsewhere in this report. Stated somewhat differently, attitude change can best be desdribed as an information processing model; information about an object or issue or about one's self leads to the formation of beliefs or attitudes. Attitude change is thus concerned with new information about an object or about one's own belief, attitudes, intentions, or behaviors with respect to that object. Both types of information may be gained through direct observation or through some communication process. This input of information will shape the individual's attitude, belief, intention, and behavior.

Involvement

The way in which communication achieves change in behavior and/or attitudes depends upon the level of the individual's involvement. When an individual is highly attentive to or involved with a subject, usually because of its importance to him, it is believed that behavioral change occurs through learning-attitude modification. Krugman (1965), however, developed an alternative hierarchy for low-involvement situations. He discussed the effect of television advertising and noted that because the audience was not involved with the advertising and had low perceptual defense to it, most of what was learned was soon forgotten. Upon being exposed to the advertisement again, however, the small amount of material retained from the first exposure was reinforced and a higher level of retention resulted, even after forgetting. Each increment is small in absolute terms, but after repeated exposure, the communicator may induce changes in the cognitive structure. These changes, in turn, increase the probability of the desired behavioral response, with the possibility that attitude change will follow behavioral change. Thus, the point of his work is that attitude change can follow behavior change.

For example, while farm efficiency ranks very high in the hierarchy of farmer values, there is ample evidence to suggest that many other values are also significant to them. Some of those values, such as being a good "steward of the soil" or a "responsible farmer" may be strengthened through repeated reinforcement. This could make farmer acceptance of nonprofitable practices easier. Using nonprofitable farm practices may in turn further reinforce the strength of those attitudes most compatible with NPS abatement.

Section 3

COMMUNICATION

The body of knowledge generally referred to as communication theory, which originated with the work of Shannon and Weaver (1949), has been transformed from its narrow mathematical definition to a highly interdisciplinary behaviorally-oriented field of research dealing with the processes of human communication. Hovland (1948) states that communication is "the process by

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD: BEGIN SECTIONS HERE

which an individual [the communicator] transmits the stimuli [usually verbal symbols] to modify the behavior of other individuals [communicatees]." This definition implies that communication occurs only when the message actually gains the farmer's attention. If the farmer ignores it, there has been no communication. In terms of human communication theory, the term *communication* can be defined as "a process by which senders and receivers of messages interact in a given context" (Gerbner, 1967). This definition implies a system of behavior, decoding and encoding activity, and linkage between the communicator and communicatees.

Interpersonal Communication

The general model of interpersonal (face-to-face) communication shown in Figure 1 is a composite of many models and theories that have appeared in the communication literature (see Engel, Wales, and Warshaw, 1975, p. 21). The nature of interpersonal communication can be illustrated by an analysis of an exchange between two farmers. Assume that farmers A and B are conversing. Farmer A has something in mind that he wants to present to B. He selects certain words that he arranges in a pattern or sequence to be ready for transmitting. This process is referred to as the communicator's encoding activities. The encoded message is then transmitted through some form of channel, such as the spoken word. Farmer B receives the message and searches for meaning--the communicatee's encoding activity. The actual effect of the communication is determined by the manner in which the communicatee perceives the message. If the perceived content differs from the intended content, the intended communication does not take place. This discrepancy is the result of "noise" (e.g., such things as bias or misunderstanding) in the message and channel. It can also result from a difference in the attitudes of these two persons with regard to whatever is being communicated.

Mass Communication

Mass communication is somewhat similar to interpersonal communication. A major difference between these two processes, however, is that with mass communication (such as pesticide advertising) the message is transmitted to a large group of individuals at roughly the same point in time (see Figure 2). Also, the communicator is an organization, and the audience consists of an interconnected group of communicatees, each of whom may interact with others about the content of the communication. Except in very limited ways, however, the communicatees do not respond to the communicator (weak feedback). An example of mass communication is the interaction between government agencies and the public in the announcement of the provisions of a new farm program.

Most mass-communication systems have a rather strict pattern of message flow in which the messages are packaged in regularly published vehicles such as newspapers, magazines, television, and/or radio. A member of the audience either receives or does not receive the vehicle. If he does not receive it, the message will not be seen or heard. Moreover, even if he does receive it, there is only a conditional probability that he will be exposed to that particular message. For example, only a certain percentage of the

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

TYPING GUIDE SHEET

BEGIN FIRST LINE OF TEXT HERE

CENTER OF PAGE

TOP OF IMAGE AREA

DROPPED HEAD: BEGIN SECTIONS HERE

Figure 1. Interpersonal communication.*

Figure 2. Mass communication.**

*Engel, J. F.; Wales, H. G.; and Warshaw, M. R. 1975. Promotional Strategy, 3d ed. Homewood, IL: Richard D. Irwin, Inc., p. 21.

**Ibid, p. 27.

BEGIN LAST LINE OF TEXT

3/8"

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

PAGE NUMBER

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
6-1/2"
9-1/8"
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

farm audience owning radios will hear a radio announcement of a new farm program. This conditional probability is also related to the audience's selective perception, attention, and retention. These characteristics will be discussed in detail later in this section.

Like the interpersonal model, the mass communication model is also a composite of many models and theories in the communication literature, but the essence of the process has been generally agreed upon (see Engel, Wales, and Warshaw, 1975, p. 27). The model has four components: the communicator, the message, the channel, and the audience.

The Communicator

The communicator is usually an organization such as a commercial firm or a government agency. The goal of the communicator is to educate or inform the audience about a particular topic or to persuade them to accept a particular point of view. For example, a company has developed a new product, such as a new herbicide. In announcing this new product, the company will be the communicator.

To communicate effectively, the communicator must have source credibility, which is defined by Hovland, Janis, and Kelly (1953) as consisting of two components: 1) expertness, or the extent to which the source is considered capable of making valid assertions, and 2) trustworthiness, or the extent of the communicatee's confidence that the source is actually making valid assertions. Variations in source credibility will lead to differences in communications impact. If the source is seen as being inept, or not trustworthy, the impact of the message will be reduced. If the source is seen as being expert and "having no axe to grind," then the message is more likely to influence the communicatee. For example, if a farmer perceives the Cooperative Extension Service as "knowing what they are talking about," he will be more likely to attend to and accept a communication from them, all other things being equal. On the other hand, if he mistrusts a particular agency, a message from them may be seriously hindered in its desired effect.

The Message

The message is the content or text of the communication. It can appear in verbal or symbolic form through visual or print media. It is generally more impersonal than the message transmitted through face-to-face channels because it is directed to a group rather than to an identified individual. Therefore, it is difficult to orient its content to achieve maximum impact on a given person, and the content of the message itself must prove suitable for a target group.

The message is generally only part of a larger campaign theme that attempts to communicate the most desirable meaning for its subject and to arouse the individual's desire for it as well as to tell him how to satisfy that desire. The communicator should focus on the communicatee's perception of the message's meaning and design his subsequent messages accordingly. In the case of a conservation program, the message would very likely attempt to

BEGIN FIRST LINE OF TEXT HERE

TYPING GUIDE SHEET

CENTER OF PAGE

TOP OF IMAGE AREA

generate in the communicatee a favorable reaction to the program being announced--a desire to participate in the program--and to indicate how the individual could take part. The message must be consistent with the desired image of the subject and must attempt to build, refine, and extend it. While there are several basic methods of designing a message, it is outside the purpose of this report to examine them.

DROPPED HEAD; BEGIN SECTIONS HERE

The Channel

The Channel is the vehicle or medium by which the communicator distributes his message. It includes such media as radio, television, magazines, newspapers, posters, films, books, and pamphlets. The disadvantage of mass communication is that the contact between the communicator and the communicatee is not personal, and the feedback from the communication is therefore weak, delayed, and sometimes unrepresentative. The main advantage is the low cost of reaching a large number of receivers, and it is often the most expedient way of reaching an audience.

Communication channels can be classified according to whether or not the communicator can exercise direct control. Communicator-controlled channels include various types of advertising media and personal contact. Noncommunicator-controlled channels are the interpersonal (personal-influence) communications between two or more people linked together in some informal group. For example, information on pesticide performance is passed among farmers without control by the communicator (manufacturer). The effectiveness of communication channels will depend upon the following:

1. How much attitude or behavior must change before the policy can be adopted

2. How new the policy concept is

3. How much risk is perceived in adopting the policy

4. The extent to which strongly held attitudes are affected

5. Strength of group sanctions toward behavior concerning this policy

Generally, interpersonal communication is more effective than any other communication channel because of its personal nature. In addition, exposing an individual to more than one channel may increase the likelihood of response because of the cumulative effect achieved, so such channels should be viewed as complementary rather than competing. Nevertheless, the fact is that interpersonal communication is seldom effective alone. While powerful, it is not under the communicator's control, and his efforts to influence it will often be unpredictable and more costly than mass-communication channels.

Rogers (1962) has concluded that the mass media are the most successful in changing levels and types of knowledge, but if used alone, are unlikely to result in substantial changes in strongly held attitudes or overt behavior. They are more likely to result in changes for less important

BEGIN LAST LINE OF TEXT

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

products or issues (Krugman, 1965). On the other hand, Rogers observes that interpersonal communications are the most successful in achieving attitude change. Thus, for the more strongly held attitudes it is often most appropriate to use a combination of various mass media and interpersonal channels. Therefore, in the highly complex area of soil conservation, involving strongly held attitudes, it will likely be necessary to use several channels.

As will be discussed later in this report, the mass-media user has to contend with selective exposure, attention, and retention. While some of these selective mechanisms are operative for interpersonal channels as well, the message's adaptive ability in face-to-face channels makes it easier to overcome them.

The Audience

The audience is the object of the communication even though its members may not be known to the communicator. Members of the audience have no obligation to pay attention to the communication, but each member is a unique person who will selectively perceive the incoming message. Each has the power to screen out unwanted communication through selective exposure, distortion, and retention processes. Unfortunately, the communicator may not be aware of low levels of audience attention because of the inherent weakness of feedback in mass communication.*

Communication with an audience is a social process, and this social function can be significant. Individuals often interact with others within or outside their group regarding the message content. Ideas and experiences will be exchanged. If an individual perceives the group as reacting favorably to the topic of communication, he is more likely to accept it. If the group, however, is perceived as reacting unfavorably to the communication, the power of the social group may dominate and influence the decision process for an individual within the group. Thus, a farmer may favor a mandatory soil-erosion-control policy but speak in opposition to it in order to conform to the attitudes of his group. It is also quite possible for farmers who are using good conservation practices to oppose government programs, especially if they are mandatory.

In this context, the individual farmer must be viewed as an information processor. In this role, the farmer compares all the information he receives with his existing beliefs and attitudes. The outcome of this judging process determines whether a particular communication will be rejected, accepted, distorted, or modified.

Summary

While the communicator, the message, the channel, and the audience are the major components of the communication model generally used in communication literature, this model is only a framework of human communication theory. The dynamics of communication and attitude change have been

*A recurrent theme in this report is that proper communication planning can help offset this weakness.

BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
BEGIN LAST LINE OF TEXT
3/8"

PAGE NUMBER
EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
PAGE NUMBER
EPA-287 (Cin.) (4-76)

extensively explored by many researchers. Although it is not the purpose of this report to examine their findings in detail, several of the general problems that would be encountered in developing an effective communication strategy relative to NPS control programs will be discussed next.

Barriers to Communication

Selective Exposure

People cannot attend to all of the messages appearing on all of the media. Since they cannot read all the magazines, watch all the television programs, or listen to all the radio broadcasts, selective exposure to media and to messages results. For example, while a farmer may read the *Prairie Farmer*, it is likely that few urban dwellers do so. Also, if a person does not read the *New York Times*, he will not be exposed to the stories, advertisements, and features that are unique to that newspaper. It is even impossible for farmers to read all of the farm media, attend all extension service programs, listen to all radio, and view all the television messages aimed at them. Selective exposure can be partially overcome by being careful to place messages in the media that are attended to by the desired audience.

Selective Attention

Placing a message in the appropriate media used by the communicatees, however, does not guarantee attention to the message. Even though exposed to a communication, communicatees often ignore it because it appears to be of low value to them or inconsistent with their existing attitudes. Engel, Wales, and Warshaw (1975, pp. 62-65) list five factors that influence selective attention. The first is the influence of "need states"; e.g., if a farmer observes several gullies on his farm he will be more attentive to conservation messages. Second is the influence of "perceptual defense." People avoid, if possible, communications that are threatening or are of low value. Third, people pay more attention to words or communications that represent values or needs important to them. Fourth, people also behave in a way consistent with their perception of "who they are." They therefore avoid communications that are not consistent with their currently existing set of attitudes. Young farmers, for example, may show little concern for retirement and estate planning. Finally, some communications are ignored out of "boredom." People think that they already know what the communication is about and therefore do not attend to it, even though it may contain new information. The long history of attention to soil conservation may make this a relevant problem.

Successful communicators are constantly looking for ways to overcome selective attention. They use a wide variety of attention-getting devices in addition to novelty and surprise.

Selective Comprehension

Attention does not guarantee that the meaning desired by the communicator will be the meaning assigned by the communicatee or that the message will

BEGIN FIRST LINE OF TEXT HERE

TYPING GUIDE SHEET

CENTER OF PAGE

TOP OF IMAGE AREA

result in the desired action. The assigned meaning or action resulting from a received communication is often distorted by the communicatee to make it consistent with his existing attitudes. This distortion is reflected in the popular phrase "you hear what you want to hear." The communicatee, in essence, makes the communication fit his or her attitude structure rather than changing the attitude structure to fit the communication. The person who does not believe reduced tillage is appropriate for his farming operation may believe that the possibility of weed problems on some occasions is an adequate indication that the technique is not acceptable even if the thrust of the message indicates that it will work well.

DROPPED HEAD; BEGIN SECTIONS HERE

Selective Retention

People do not remember all they hear. Certain stimuli of a message will be remembered if they are essential to the individual's need-value system. Most communication messages, however, will be forgotten unless reinforced by follow-up communication. The laboratory experiment by Hovland, Janis, and Kelly (1953) shows that following exposure to messages some 50 percent of the material may be remembered in the very short run (a day or two), but retention tends to stabilize at about 30 percent after a period of up to another 100 days.

Other Problems

Even assuming that the message gains exposure, perception, and retention, a person's response is by no means automatic. People are active agents in information seeking and decision making, and respond to communications in line with their particular needs, interests, motivations, and overall attributes.

Furthermore, it should be noted that the communication process seldom is limited to a single communication event. The communicator must be concerned with a campaign's overall effect over time. Thus, the communication system should be seen as an ongoing process with information being introduced continually from the environment. Any one event taking place within the communication system has a low probability of resulting in an anticipated outcome, but the communication event may take the audience member further along the compliance decision process if it is properly directed at the intended audience segment. This suggests that a single extension meeting, flyer, or television "spot," should not be expected to result in a change in behavior.

Summary

Within the context of the communication models just presented, we must recognize that each farmer brings not a blank mind, but a set of attitudes, values, and beliefs that represent who he is: a product of his background and experiences. These antecedents interact with the communication channels, and the result of this interaction is behavior on the part of the farmer who has been exposed to a communication. Some of these antecedents, channels, and behaviors are listed in Figure 3.

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

BEGIN LAST LINE OF TEXT

3/8"

PAGE NUMBER

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

Specific attention must be given to the characteristics of the farmers with whom we hope to communicate. In particular, attention should be given 1) to their attitudes as they may affect their response to a communication, 2) the role of farmer involvement with the issue that is the focus of a communication, and 3) hindrances to effective communication. Without a modest level of understanding of these topics, efficient communication will be much more difficult to achieve. The implications of the information system (Fig. 3) for policy implementation will be discussed in the next section.

Section 4

IMPLICATIONS FOR POLICY IMPLEMENTATION

Based on the background understanding of attitudes, values, and communication presented above, we now turn to their implications for policy implementation. In this discussion we concentrate on the social-psychological aspects of policies rather than the technical, economic, or the detailed institutional aspects of policy development and implementation. We believe that the questions discussed here will be important regardless of the specific nature of the policy. Because of the complex interactions among the variables involved, there will be considerable overlap among the topics discussed in this section.

The Information System

Success in the implementation of an NPS pollution-control policy requires the recognition of two important facts. First, farmers' attitudes surrounding the issue are probably strongly held because they are directly related to their pictures of themselves as independent and successful farmers. Second, no single communication channel, whether it be mass or interpersonal, can be expected to effect change by itself. Thus an integrated communication strategy, using a variety of messages and channels, is going to be needed to achieve the desired results.

A simple listing of the channels through which a farmer receives information and is influenced gives an indication of the scope of the task. Such a list has been shown in Figure 3. Listed in the left column are those antecedents that determine the selective processes resulting in exposure, attention, and retention of the information conveyed in these channels. The behaviors resulting from the communication are listed in the right column.

From Figure 3 it can be seen that, for any given farmer, a communication's information and influence are determined by its interaction with antecedent conditions. Since such a wide variety of communication channels is available, it is appropriate that the relative advantage of each be used when communicating about a particular policy. Each channel has its own set of advantages and disadvantages, and a knowledge of channel effectiveness becomes particularly important when one channel contains negative information and another positive information. Even then, resulting behaviors are not known and predictable with certainty, but good planning can sharply increase the probability of success. The exact determination of the influence

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
1/2"
9-1/8"
BEGIN LAST LINE OF TEXT
3/8"
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

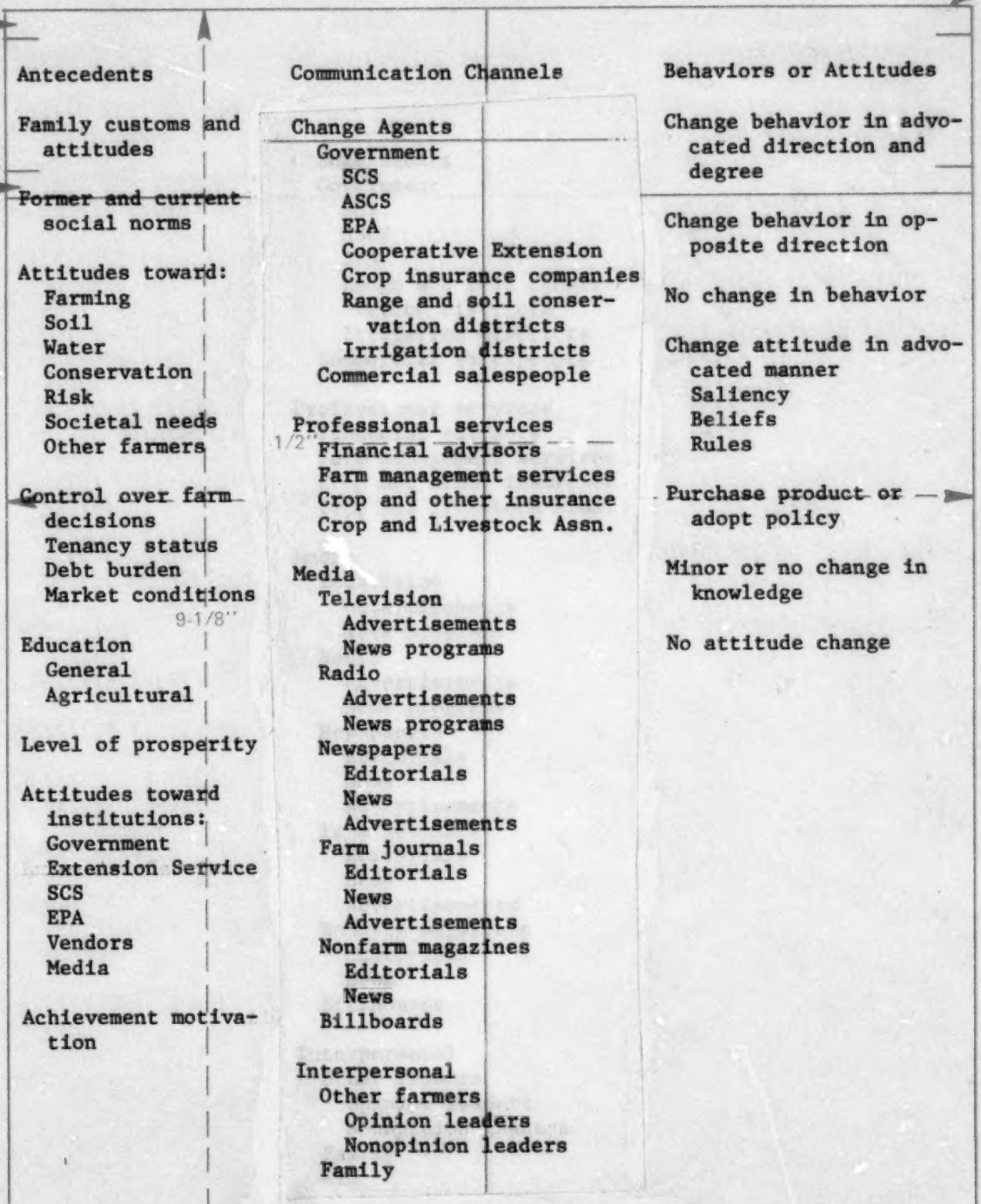


Figure 3. The Information System

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA, OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

of each of these channels will have to be specific to the policy under consideration and its interaction with the attitudes and beliefs of the individual farmer.

The Role of Communication

The legal and technical backgrounds of many people involved in public policy do not provide them with an understanding of the contribution of effective communication to the implementation of public policy. It is therefore possible to find examples of programs in which the technical and legal aspects are sound, but the total impact of the program has been impaired because effective communication has been overlooked. As a result, incorrect assumptions have been made about the behavior of the affected group, how its members receive their information, and what factors determine their reactions to the communication.

While communication's role is somewhat different for voluntary versus mandated programs, in either case communication must be properly integrated into the total implementation plan so that its goals can be reached more efficiently. Failure to incorporate an understanding of farmer attitudes and communication approaches into policy implementation increases the potential for the following effects, any of which will reduce implementation efficiency.

Misunderstanding

If the communication is not perceived in the same way it is intended, the reaction will quite likely not be as desired. While governmental agencies may perceive Best Management Practices (BMPs) as the best way to serve the public's interest, farmers may see them as an outside attempt to dictate to them how to run their enterprise.

Increased Administrative Costs

Failure to plan in advance for effective communication will probably result in increased administrative costs because of unforeseen compliance or acceptance problems which may subsequently require more expensive means of communication with the intended groups of farmers.

Press and Public Negative Reaction

If farmers misunderstand the logic behind a policy affecting them or do not perceive the policy positively--as consistent with their attitudes--their subsequent behavior may receive news media attention that further reduces the efficiency of implementation by focusing on negative aspects. A negative letter to an editor could be quite damaging to program acceptance regardless of the accuracy or relevance of the letter.

Failure to Include the Commercial Sector in Plans

For many decisions, farmers seek advice and services from the commercial sector, which therefore plays an important role in communication. By

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

understanding the particular strengths and weaknesses of the commercial-sector information system, communication efficiency will be higher. While several favorable articles in leading farm journals may be helpful, the comments of dealers and the way in which they present their products and services in relation to policies is often critical to successful policy implementation. Farm implement dealers may have the dominant influence in the choice between a chisel and a moldboard plow. Dealers will influence the type of fertilizer used and its rate of application and the types of pest control utilized.

Contribution of Involvement to Attitude Change

A major determinant of an individual's response to a communication is the degree of the issue's importance to him or his involvement with it. For example, if a farmer has a low level of involvement with a particular topic, he is not strongly committed to any particular point of view regarding it. Issues with which the farmer's involvement will probably be low are nonfarming ones such as urban and societal problems and consumer products. In these cases, attempts aimed directly at changing behavior will be largely ineffective. It has also been found that communication using logical arguments will likely not be received by the farmer with low involvement. For low involvement issues, the proper approach to communication is repetition directed at changes in the farmer's awareness, attention, or interest. Through repeated learning and forgetting cycles, an awareness can be built. It is almost certain, however, that this awareness will not induce behavior, but will only make the person receptive or favorably disposed toward the topic.

For high-involvement topics, Sherif, Sherif, and Nebergall (1965) have indicated the absolute necessity of using communications that are designed to correspond closely to the existing beliefs of the farmer. Otherwise, selective attention and comprehension will defeat the intended effect. In addition, changes in attitude must be made slowly because attitudes and values related to high-involvement issues are strongly held and closely tied to the farmer's picture of himself. They are therefore difficult to change.

Soil erosion and the policies directed at its control are important, high-involvement issues for most farmers. The expected changes in behavior will impinge on strongly held attitudes or values--a fact that must be recognized if an effective educational communication strategy is to be developed. Communication should not threaten the existing beliefs of farmers, and at the same time the communication should aim to gradually strengthen the attitudes supportive of NPS-control programs. Past government-sponsored educational programs have been unabashed in promoting the value of agricultural efficiency. This precedent can be used to argue that governmental educational messages should now contain the promotion of additional values, such as giving higher priority to environmental concerns. Such value messages, however, would no doubt stir controversy, unless wide support has been achieved in society.

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE

TYPING GUIDE SHEET

CENTER OF PAGE

TOP OF IMAGE AREA

DROPPED HEAD; BEGIN SECTIONS HERE

Modernization theorists (Polanyi, 1944) report that until recently economic activity was embedded in and controlled by a web of institutional arrangements and social relations. Certainly, the complete rationalization of agriculture, as reflected in the usage of the term *agribusiness*, is a relatively recent phenomenon. Previous authors (Hadwiger, 1962; Fite, 1962) attribute a traditional set of beliefs and attitudes to farmers that they have labeled"farm fundamentalism." The thrust of this concept is that rural living represents an experience intrinsically valuable above and beyond the profits that can be derived from agriculture. It also posits the existence of a special "man-land" relationship that entails the responsibility of good husbandry on the part of the land users. If a link could be made between the current conservation thrust and this tradition, acceptance of NPS pollution-control programs may increase.

One would expect such an appeal to be most effective in persuading those farmers who share the belief in the value of farm living, and least effective on farmers for whom agriculture is primarily a business. However, if conservation efforts are to avoid the repeated crash-program syndrome, then the need for an enduring conservation ethic is paramount. C. G. McNable (1976), an Extension economist commenting on the current NPS pollution control effort, has expressed the problem in this way:

> I believe that unless there is a deep commitment to good land husbandry on the part of the owner and operator, the road to accomplishment will be a rough one indeed. This commitment has to be developed as a part of our culture. It can be done through education and training, motivated by an understanding of the consequences of inaction.

Financial Incentives

For almost all farmers, the attitude that farming should be profitable must be taken as a given assumption. While not every decision made by a farmer is consistent with the profit maximization goal, it is clear that acceptance or compliance will be harder to achieve if an NPS pollution-control program involves nonproductive expenditures. The results of a survey by Seitz et al (1978) indicate that many farmers are aware of erosion problems and would take action if they could do so without reducing the profitability of their operation.

Even if NPS pollution-control programs benefit the farmer in the long run, in the short run he needs to deal with farm budget considerations (Sharp and Bromley, 1978). The individual farmer has no control over market forces and no ability to pass on additional costs to the product purchaser. He must therefore absorb additional costs either financially or in terms of his lowered return on labor, including inconvenience.

Market forces could be manipulated so that farmers would be in a better position to adopt NPS pollution-control practices. Current government food and agricultural policies, however, do not encourage the farmer to adopt conservation practices. Government agricultural policies have frequently placed a premium on economic farm efficiency with the result that the importance of pollution control has become incidental. While government agencies

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

BEGIN LAST LINE OF TEXT

3/8"

PAGE NUMBER

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD: BEGIN SECTIONS HERE

charged with NPS pollution control cannot affect agricultural policies, it should be understood that governmental policies that manipulate market prices (such as various subsidy and agricultural income-maintenance programs) could be made more sensitive to NPS pollution-control requirements. Local government zoning and taxation programs, too, could be more sensitive to the need for maintaining water quality (Seitz et al., 1978). The USEPA recently has given an example of the possibilities for such interaction in announcing its new policy to protect farmlands.

At present, however, NPS pollution-control policies focus on inducing individual farmers to combat NPS pollution voluntarily with cost-share incentives. The policies aid the farmer, not by changing market forces, but by mitigating the economic impact on the farmer (Rural Clean Water Program [PL 95-217]).

Some of the incentives that have been suggested to date include expanding the current programs of cost sharing, technical assistance, and income-tax credit as well as instituting new incentives such as abolishing cost-sharing ceilings and eliminating income taxes on cost-sharing payments. Usually, incentive programs are defined in terms of short-term inducements to help farmers make certain changes or physical improvements, but after such a project is complete it may do little to enhance the short-term productivity of the land. In addition, the farmer's financial problem is compounded if the program calls for a land use that interferes with production.*

9-1/8"

The most appropriate incentive programs may be those dealing with one-time investments in capital improvements or management changes which bring about conditions which are neutral or positive in terms of future profitability. When used under different circumstances, incentive programs might create a farm population continuously dependent on government subsidies, or, in the absence of such subsidies, NPS pollution-control objectives might not be met because farmers were economically forced to return to earlier practices.

A special concern with incentive programs is the need to establish carefully defined criteria for participation. In the past, participation has generally been limited to those farmers who perceived financial benefit from their participation. More carefully designed programs should attempt to reach those situations where the greatest NPS pollution can be controlled. This attempt may require some type of local priority designations, making incentives available only to those of high priority.

Regulatory Activity

Regulatory programs for NPS pollution control would be faced with a number of enforcement difficulties because of farmer resistance. Before discussing these problems in any detail, however, we should examine what is presently known about the efficacy of programs to control NPS pollution.

---

*In other words, the farmer may face a situation in which the incentive will help defray one-time costs, but he may find himself then in a situation where his income in succeeding years is not helped by the incentive program.

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

The control of NPS pollution in agriculture is difficult because there is no good measurement of the origin and degree of the pollution. Emission standards, which underlie many of the incentives and tax policies modeled by economists, in effect do not exist in agriculture (Sharp and Bromley, 1978). As a result, policy is oriented toward activities (best management practices --BMPs) that are deemed beneficial in a general sense, but whose efficacy in providing cleaner water cannot actually be demonstrated to farmers in their individual case (GAO, 1978). This limited information about program efficacy creates problems for NPS pollution-control programs of any kind, but it makes mandatory programs especially vulnerable to charges of regulatory capriciousness and rigidity. This limited information also tends to exacerbate enforcement and other problems created by farmer attitudes.

Since the prohibition era we have been more aware of the difficulty of implementing policy for which strong public support does not exist. In addition, farmers and their leaders have displayed strong value opposition to government regulation of their activities, particularly to programs that affect their autonomy in farm decision making. This opposition is strongly ideological, based on widely held beliefs of individualism and independence. These values are further enforced by the perceived economic threat posed by regulations, as discussed previously. However, we also note some of the conditions necessary for successful implementation. Furthermore, a strong belief on the part of farmers about the general incompetence of the governmental bureaucracy, especially when dealing with agriculture, also serves to further strengthen opposition to regulatory programs.

The success of most regulatory programs is due in part to the fact that they can be reasonably enforced at some cost. NPS pollution-control programs face special enforcement problems. We have already alluded to the limited information about program efficacy and the resulting difficulty in determining performance criteria. A second problem is the diffuse nature of the pollution sources, combined with the particular sensitivity of agriculture to local conditions such as topography, climate, and land-use patterns. This diversity makes it difficult to implement and enforce centralized and uniform policies. Consequently, many NPS pollution-control policies will rely heavily on local implementation strategies.

Enforcement therefore poses real problems for mandatory NPS pollution-abatement programs. Premature rigidity in enforcement standards may result in costly and ineffectual programs. If so, a mandatory program may not be able to capitalize on the technological and managerial innovations that may come out of a system in which each cooperator has the autonomy to select the best possible solutions.

Harder et al. (1978) have emphasized that local agencies frequently lack the authority to enact guidelines as well as the money for adequate compliance and monitoring activities. In addition, while formally maintaining high degrees of citizen input, many of these agencies have in the past acted largely only as coordinating and grant-giving agencies. Thus, the local organizational structure is often not geared to a more active role of priority decision making, resource allocation, and program implementation. These problems can certainly be overcome, but they should be given considerable attention.

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

While farmers place a high value on their autonomy in farm decision making and on unrestricted property rights, they have accepted regulatory activity interfering with their decision-making autonomy in such areas as grading standards for farm products, milk-marketing orders, and many public-health regulations, even though some of these do not generate economic benefits. While farmers have not necessarily cherished these regulations, there is little evidence that compliance problems have been widespread once the regulations have been introduced. It may be illustrative to review the introduction of health standards in the dairy industry.

The acceptance of health standards by dairy producers has been generally successful because of a number of forces operating simultaneously. Producing disease-free milk is a value widely supported in society. Through educational and incentive programs, an increasing number of farmers were induced to participate in programs. At the same time, in order for the program to succeed all farmers in a certain pool needed to participate; the milk from any one dairy herd might affect the quality of all the milk processed at a collection station. Thus, once farmers participated in a program, they developed a strong interest in having all other farmers participate as well. Regulations in the dairy industry were enforced at least in part at a central collection point where milk could be tested quickly and effectively and violators immediately identified. Because of price differentials, a continuing economic incentive for participation in the program reinforced the decisions dairy farmers had made earlier. Finally, many dairy farmers faced with considerable capital outlays in order to participate in the program found a favorable alternative to dairying in changing to other industries such as grain or beef production. In this case, therefore, the introduction of regulations was supported by a variety of circumstances that contributed to their wide acceptance.

After our previous discussion it must be clear that in the case of NPS pollution controls, many of the reinforcing supports operating in the example of the dairy industry are not present. It therefore seems safe to say that without 1) an extensive educational campaign aimed at creating a positive attitude, 2) participation of farmer representatives in the decision-making process, and 3) incentive programs it will be difficult to overcome the expected negative reactions by farmers to any infringement on their freedom of decision-making. If the program thrust moves beyond erosion control where a long run benefit can be argued, to control of nutrients and pesticides where almost all of the benefit accrues to others, the situation is even more difficult.

Citizen Participation

Harder et al. (1978) report that early local involvement in policy development can be the basis for an effective education and information program. It can also serve as an effective tool for increasing program participation in either a voluntary or a mandatory program. Although citizen participation is the historical base of our form of government, its scope has changed recently under the impact of both ideological and organizational changes in society. Not too long ago the right to participate in decisions was predominantly the right of those who provided the resources needed to

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

PAGE NUMBER
EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

implement those decisions. But recent examples of citizens attempting to gain some control over public decisions affecting their lives show that the demand to be involved in decision making has become much more widespread. Increased bureaucratic complexity has made citizen participation a permanent feature of our society (Weeks, 1970; Carroll, 1971).

The term *bureaucratic decision making* refers to the process by which members of the bureaucracy and others outside it determine the major objectives of a program and the ways in which these objectives will be accomplished. Citizen participation in bureaucratic decision making can be defined as:

> . . . the acts of those who are not formally part of the legislative or public administrative hierarchy, but who nonetheless intend to influence the efficacy of the program and the behavior of those public officials responsible for ultimate policy and operational decisions. (Spiegel, 1971)

The representatives of bureaucracy always form one group of participants in the decision-making process; the citizens make up another component. Citizen participants in this context are generally considered to be lay people rather than professionals with formally recognized expertise. Citizens participate in the decision-making process as representatives of the public, although water-quality planning, for example, has shown that in practice both the delineation of who is being represented and the form of selecting citizen participants in the decision-making process often remain obscure.

Citizen participation is usually sponsored by the bureaucratic organization, which tends to initiate the process, define its purpose, and set its boundaries (Seaver, 1971). The share of the citizen participants in the decision making can be measured along a continuum ranging from total powerlessness to full decision-making control. In cases of total lack of power, citizen participation is a form of manipulation by the bureaucracy. At the other extreme, few bureaucracies will surrender to citizen participants all their power to make decisions, probably because of 1) their claims to special expertise and 2) their accountability to other constituencies.

Most forms of citizen participation are perceived by the bureaucracy as a form of cooptation--as a means to further their established objectives (Bachrach et al., 1970, pp. 206). But failure to understand the different functions citizen participation may play in decision making has frequently created hostilities and frustrations for both the bureaucracy and the citizen participants. For example, in certain programs citizen participation is defined as an educational activity to be undertaken for its own merits (Zurcher, 1970). It is expected to lead to increased understanding, changes in values, and improved organizational or technical skills for population segments that have not had prior opportunities to acquire these skills. Although the citizen participant may perform certain functions within the bureaucracy, their relationship is essentially tutorial.

Citizen participation is also frequently encouraged when those participants are judged to possess useful information (Kramer, 1969, pp. 11-12). Such informants are especially useful to the bureaucracy in cases where large

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

cultural gaps exist between bureaucrats and target populations and in cases where the bureaucracy deals with widely differing local settings. For this reason, many government agricultural programs have relied heavily on the participation of local farmers on advisory boards, etc., usually to improve operating procedures, to suggest how resources may be put to most effective use, and to avoid conflicts with established interests.

Another frequent objective of citizen participation programs is to justify the bureaucracy's activities and bolster its power. Boards of "prominent citizens," representatives of special-interest groups, and "local leaders" may find themselves having to protect resources or ward off disgruntled citizens (Piven, 1966). In some cases, the sheer existence of citizen participants may be enough to legitimize and strenthen bureaucratic programs, but in most cases the citizen participants are a more active liaison with the community.

Citizens can affect the bureaucracy in many ways to make it better serve their interests. One way is to provide information, but there is no guarantee that citizen input will be used. Citizens affect bureaucratic operation more strongly when they formally share power in the decision-making process. Involving farmers in program decision making can be very beneficial to the bureaucracy and its programs, but unless both bureaucrats and farmer participants arrive early at an understanding of what their roles are and how their power is distributed, the participation process may become very frustrating. The bureaucracy may find that the farmer participants are directing the program into unanticipated areas, and the farmers may find their efforts at participation frustrated by a bureaucracy unwilling or unable to respond to their interests.

While more attempts are being made to broaden the base of citizen participation, studies point to the difficulties of reaching certain sectors of the population (Long, 1971; McCluskey, 1970; Oberle, 1970). It should be expected that smaller, part-time, and less-educated farmers and those who are less active in their communities will frequently not be represented. The more usual citizen participants are local political or economic "elites" or their representatives. Frequently, agricultural programs have deliberately aimed at the participation of local leaders in program decision making, frequently as a form of cooptation of local interests.

Some researchers of citizen participation (Van Til and Van Til, 1970; Wilson, 1963) have pointed out that leaders and nonleaders tend to act differently in decision-making positions; local leaders tending to function as consultants, advisors and legitimizers of the bureaucracy's programs. Experience indicates that program objectives frequently reflect positions subscribed to by local leaders, who rarely find themselves directly threatened by planned outcomes. However, the assumption that local leaders represent what is best for all sectors of the population has often proved erroneous. Although it is sometimes argued that nonleader participants are parochial and self-centered in their interests (Wilson, 1963), several factors may account for this viewpoint. In the first place, nonleaders frequently become citizen participants precisely because they want to serve as spokesmen for certain interests not normally represented; thus, they define themselves

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

and are defined by others as "special-interest" representatives. In addition, nonleaders' concerns are sometimes defined as parochial because these concerns are not identical with, and may even run counter to, local leader concerns.*

While status differences between potential groups of participating farmers are important, in many situations other criteria may also distinguish among potential citizen participants. NPS pollution-control planning, for example, may find citizen-participation groups consisting of statewide and even specifically urban groups, while the target population of the program may be the farmers of a particular area. The selection of appropriate citizen participants is thus of great importance. The citizens selected for involvement must be appropriate to deal with the issues in question.

The ideal criterion for the success of citizen participation is the impact it has on the outcome of the process, although the impact cannot easily be quantified. In an informal analysis of the reaction of participants in the Illinois 208 planning process, Seitz (1978) found a generally favorable response by the participants, although this work was done too early for the participants to know the final outcome.

Citizen participation in planning proceeds on the assumption that the bureaucracy and the various population sectors can arrive at a consensus of goals and means. Various participants may have irreconcilable differences, however, that lead to conflict rather than compromise and consensus, and this conflict may do much to demonstrate the power relationship among the participants. It may induce either the bureaucracy or the citizen participants to withdraw, or it may lead the opposition to mobilize strongly against certain bureaucratic actions.

Most of the examples of citizen participation examined recently have covered a very limited time span. A group of citizens was assembled and hastily began "participating" in bureaucratic decision making. Participation, however, is a form of interaction that needs to be institutionalized over time. Judgments on successes and failures are often made prematurely, both by participants and outside evaluators. Citizen participation may be an effective source of information for policy makers when they construct communication programs. They can learn where attitudes are in conflict with (or are consistent with) a proposed policy, and they may be able to determine whether certain messages are received as intended. During program planning and implementation, farmer participants can, of course, play a role

*It may be worthwhile to point out here that those farmers traditionally associated with citizen participation on various government program boards, commissions, etc., are typically of the "local leader" group. While such farmers may exert considerable influence locally, it should not be assumed, for example, that they will always represent the interests of those farmers whose farms may be in the category of "greatest need" for NPS control! Agencies appear to have a strong tendency to select their citizen participants from their program participants or cooperators. Frequently the most cooperative and innovative farmers are perceived as nonrepresentative of their interests by many local farmers (Rogers and Shoemaker, 1971).

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA

well beyond that of a resource in the communication system.

DROPPED HEAD; BEGIN SECTIONS HERE

Section 5

BUREAUCRATIC COMMUNICATION

In this section we deal with another communication problem. As, and after, a program is put into effect farmers and bureaucracies will communicate with each other. While some mass communication techniques may be used, there is usually a heavy reliance on interpersonal communication. Unfortunately, most bureaucratic organizations rely on a depersonalized form of communication. Also, there is a concentration of power in such organizations which the individual does not like but feels helpless to oppose. This depersonalization and the feeling of helplessness create changes in the individual's attitude. He may avoid the agency, oppose it, or even violate a regulation simply because of his frustration with the organization style of interaction.

Katz and Danet (1973) suggest a working model for the dynamics of official client communication. Farmers easily form impressions through close contact with county agents, SCS representatives, and other state and federal officials. These impressions may, or may not, be those desired by the agencies. The implication from the Katz and Danet model is that an understanding of the official-client relationships and their specific roles can improve the communication system between the bureaucratic organization and the public. Their model can be analyzed in terms of four clusters of variables:

1. Predisposing factors that may impinge on the interaction
2. Situational variables characterizing the immediate context of interaction
3. Variables that characterize behavior during a bureaucratic interaction
4. Variables dealing with the consequences of any given interaction

That is, the model considers the relevant past experience of the official and the client, the situation in which they came together, how they interact, and what happens after their interaction as important in structuring a communication system.

In their model, communication may broadly include the complex interaction between the attitudes and expectations of officials and clients, their behavior during the interaction, and any changes in the attitudes and expectations of the parties as a result of the contact (see Figure 4).

As illustrated in the model, intervening between the actual outcome of the bureaucratic contact and the predisposing factors is a series of variables characterizing the immediate context in which the contact takes place.

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

PAGE NUMBER
EPA-287 (Cin.)
(4-76)

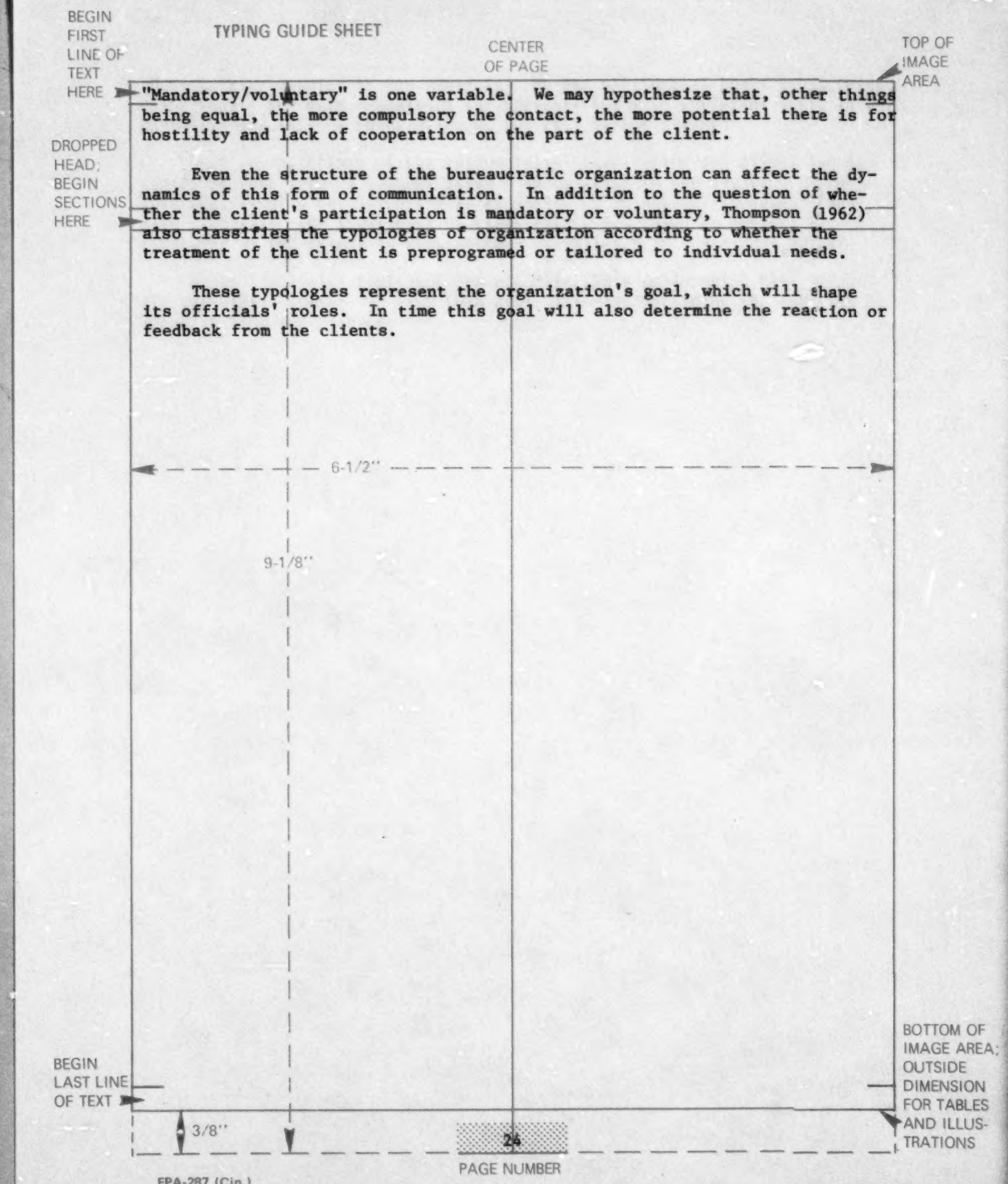

TYPING GUIDE SHEET
BEGIN FIRST LINE OF TEXT HERE
CENTER OF PAGE
TOP OF IMAGE AREA
"Mandatory/voluntary" is one variable. We may hypothesize that, other things being equal, the more compulsory the contact, the more potential there is for hostility and lack of cooperation on the part of the client.
DROPPED HEAD; BEGIN SECTIONS HERE
Even the structure of the bureaucratic organization can affect the dynamics of this form of communication. In addition to the question of whether the client's participation is mandatory or voluntary, Thompson (1962) also classifies the typologies of organization according to whether the treatment of the client is preprogramed or tailored to individual needs.
These typologies represent the organization's goal, which will shape its officials' roles. In time this goal will also determine the reaction or feedback from the clients.
6-1/2"
9-1/8"
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
24
PAGE NUMBER
EPA-287 (Cin.)
(4-76)

Figure 4. The dynamics of official-client communication.*

*Katz, E., and B. Danet. 1973. Communication between a Bureaucracy and the Public: A Review of Literature, p. 694.

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

Section 6

SOME SUGGESTIONS FOR IMPLEMENTATION

As indicated in the previous pages, a program of NPS pollution abatement will have to operate under certain restrictions. In the near future it does not seem likely that a widespread centrally-organized program of mandatory participation will be initiated. At the same time, complete reliance on voluntary programs will probably not get the job done; all indications from previous research are that certain farmers will not participate in voluntary programs and that many farmers, including those more economically innovative, will not participate in programs that will be costly to them. While incentive programs induce farmers to participate, such programs will need to be restructured if they are to meet the needs of a NPS pollution-control program. The following program steps should strengthen a NPS pollution-control program in agriculture.

Educational Program

A strong educational program providing technical information as well as stressing the conservation and environmental values involved should create an awareness of and receptivity to the need for NPS pollution control. If preventing NPS pollution carries a high national priority, farmers should be so informed and given the reasons and rationale for the program. They should be shown the importance of other values, in addition to economic ones, in their farm decision making. A strong educational campaign will be necessary for any type of implementation program and may, of course, on its own merits increase participation in NPS pollution control.

In developing such an educational program, one must understand the basics of human communication: attitudes, principles of communication, and communication systems. It is assumed that the details of the policy itself will be final at this stage and that the policy itself will have been formulated with implementation in mind.

While the basics of human communication apply to all policy-implementation situations, specific details *must be* unique to each situation. Therefore, it is imperative that steps be taken to gather specific information which, in turn, will be the basis of a uniquely tailored implementation plan for each policy. The following four-step procedure is designed to generate that uniquely tailored plan. The procedure may seem unnecessary or too simplified, but experience has consistently demonstrated that each step of this procedure should be conscientiously followed. Otherwise, omissions or erroneous assumptions may seriously hinder the effectiveness of the implementation plan.

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE

1. Determine the exact characteristics of those to be communicated with. Different segments of the farm community have different habits, attitudes, social-cultural backgrounds, and economic constraints. To many farmers NPS control programs will touch upon attitudes which are very close to their self concept. This high involvement among certain farmers will require special approaches. Landowners, renters, and owner-operators may all react quite differently.

2. Determine the political barriers. Some policies may need unique implementation strategies to overcome certain political reactions. Without careful planning, a policy may receive general acceptance but be resisted in some farming areas with powerful political clout.

3. Determine the presently used system of communication and influence. It is inefficient to launch a television-based communication program if most farmers receive their information about this topic from pesticide salespeople. It is therefore important to determine which media to use and what the balance should be between mass and personal communication.

4. Design the messages to accomplish the desired behavior. This last step is relatively easy if the above steps have been carried out. Here we need the exact words in the specific format. If we are using mass communication, we need to ask questions such as: Will the message be delivered by a well-known personality or by some other format such as a cartoon? Will the message be "persuasive" or "educational"? Will it present two sides of the issue or only one?

Restructuring Agency-Citizen Interaction

While general standards and norms may be set at the state or federal level, local units such as Soil and Water Conservation Districts will be charged with local implementation and will thus make decisions on priorities and resource allocations. In the past, local governing committees have typically responded to citizens expressing interest in a project. In the future, because local governing agencies may have to allocate resources according to the greatest need or impact, the local citizens they select for decision-making groups will have to be representative of the persons affected by the decision making, rather than just those expressing an interest in program participation.

In addition, local decision makers will need to have the technical information necessary to make priority and resource-distribution decisions, and technical agencies will need to have the authority and capability to provide this information. This practice would also be a departure from the past, when information was typically provided on the basis of individual farmer interest.

BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE

TYPING GUIDE SHEET

CENTER OF PAGE

TOP OF IMAGE AREA

DROPPED HEAD; BEGIN SECTIONS HERE

Farmer Incentives

Incentives should be structured in such a way that the money spent would yield results. We know little about those levels at which farmers will respond well to specific incentives, but it is clear that the cost of providing financial incentives to individual farmers will be substantial. State and federal governments, however, already have a large number of specialized financial transactions with farmers. Policies that would make the reception of other government benefits contingent upon participation in NPS pollution-control programs would increase the magnitude of the incentives systems without requiring large new outlays of money. Relating NPS pollution control to other agricultural policies will have many other advantages as well. It will take away the stigma of NPS pollution-control programs--that they are organized by and administered through a specialized agency intruding into agriculture. Some of these steps have, of course, already been taken at the federal level, but further integration of NPS pollution-control programs into agricultural policy would be helpful.

6-1/2"

Target Dates

9-1/8"

Local implementation groups should be given definite targets on what is to be accomplished by what date. While local implementation authority appears to be the most efficient and equitable, clearly defined objectives would do more than just provide benchmarks against which progress can be measured.

If they acquire the proper authority, local decision-making units will be in a better position to introduce mandatory participation by pointing to outside requirements. In addition, the optimal time for mandatory participation will frequently be when, through educational and incentive programs, local support has been obtained. Local support, however, will be gained at different times in various localities. Therefore, a program that provides a local option for mandatory participation may be able to make headway in many places without having to deal with a massive resistance focused on centralized regulatory power.

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS

BEGIN LAST LINE OF TEXT

3/8"

PAG

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
BEGIN SECTIONS HERE

REFERENCES

Bachrach, P.; Baratz, M. S.; and Levi, M. 1970. The political significance of citizen participation. In *Power and Poverty* (eds., P. Bachrach and M. S. Baratz). New York, N.Y.: Oxford University Press.

Carroll, J. D. 1971. Participatory Technology. *Science* 171:647-53.

Engel, J. F.; Wales, H. G.; and Warshaw, M. R. 1975. *Promotional Strategy*, 3d ed. Homewood, IL: Richard D. Irwin, Inc.

Fishbein, M., and Ajzen, I. 1975. *Belief, Attitude, Intention and Behavior.* Reading, Mass.: Addison-Wesley.

6-1/2"

Fite, G. C. 1962. The historical development of agrarian fundamentalism in the nineteenth century. *J. Farm Econ.* 44:1203-11.

Gerbner, G. 1967. Mass media and human communication theory. In *Human Communication Theory*, ed. F. E. X. Dance, p. 43. New York, N.Y.

General Accounting Office (GAO). 1977. *To Protect Tomorrow's Food Supply, Soil Conservation Needs Priority Attention.* CED-77-30. Washington, D.C.: U.S. Government Printing Office.

Hadwiger, D. V. 1962 Farm fundamentalism--its future. *J. Farm Econ.* 44: 1218-30.

Harder, S. M.; Daniel, T. C.; and Madison, F. W. 1978. Guidelines for mandatory erosion control programs. *J. Soil Water Conserv.* March/April: 80-84.

Hovland, C. I. 1948. Social Communication. In *Proceedings of the American Philosophical Society* SCII, 12.

Hovland, C. I; Janis, J. L.; and Kelley, H. H. 1953. *Communication and Persuasion.* New Haven, Conn.: Yale University Press.

Illinois Agriculture Task Force. 1978. *Summary of the Agriculture Task Force Water Quality Plan Recommendations.* (March).

Katz, E., and Danet, B. Communication between bureaucracy and the public. In *Handbook of Communication*, (eds., T. D. Pool and W. L. Schramm). Chicago: Rand McNally.

Kramer, R. M. 1969. *Participation of the Poor: Comparative Community Case Studies in the War on Poverty.* Englewood Cliffs, N.J.: Prentice-Hall.

Krech, D.; Crutchfield, R.; and Ballachey, E. L. 1962. *Individual in Society.* New York: McGraw Hill, Inc.

BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
BEGIN LAST LINE OF TEXT
3/8"

EPA-287 (Cin.)
(4-76)

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
EPA-287 (Cin.)
(4-76)

Krugman, H. E. 1965. The impact of television advertising: learning without involvement. *Public Opinion Quarterly* 29(3):349-56.

Krugman, H. E. 1966. The measurement of advertising involvement. *Public Opinion Quarterly* 30(4):583-96.

Long, H. B. 1971. A comparison of participants and nonparticipants in a community development program. *J. Community Devel. Society* 2:59-66.

McNable, C. B. 1976. Controlling non-point pollution under the 208 plan. *Economic and Marketing Information for Missouri Agriculture* 19(9). Columbia, MO: University of Missouri Cooperative Extension Service.

McCluskey, H. Y. 1970. A dynamic approach to participation in community development. *J. Community Devel. Society* 1:25-32.

Oberle, W. H. 1970. Who are extension council members? *J. Extension* 8:25-31.

Pampel, F. C., and van Es, J. C. 1977. Environmental quality and issues of adoption research. *Rural Sociology* 42(1):57-71.

Piven, F. F. 1966. Participation of residents in neighborhood community action programs. *Social Work* 11:73-80.

Polanyi, K. 1944. *The Great Transformation.* New York: Farrar and Rinehart.

Rogers, E. M., and Shoemaker, F. F. *Communication of Innovations.* New York: Free Press.

Rogers, E. 1962. *Diffusion of Innovations.* Glencoe, IL: The Free Press.

Rokeach, M. 1968. *Beliefs, Attitudes and Values.* San Francisco, CA: Jossey-Bass.

Seaver, R. C. 1971 The dilemma of citizen participation. In *Leadership and Social Change,* (ed., W. R. Lassey), pp. 233-40. Iowa City: University Associated Press.

Seitz, W. D.; Gardner, D. M.; Gove, S. K.; Guntermann, K. L.; Karr, J. R.; Spitze, R. G. F.; Swanson, E. R.; Taylor, C. R.; Uchtmann, D. L.; and van Es, J. C. 1978. *Alternative Policies for Controlling Nonpoint Agricultural Sources of Water Pollution.* EPA-600/5-78-005. Athens, GA: Environmental Research Laboratory.

Seitz, W. D. 1978. "Ag Task Force Plans Water Cleanup," *Illinois Issues* IV (6), p. 22.

Shannon, C. E., and Weaver, W. 1949. *The Mathematical Theory of Communication.* Urbana, IL: University of Illinois Press.

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD; BEGIN SECTIONS HERE
6-1/2"
9-1/8"
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA; OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
EPA-287 (Cin.)
(4-76)

Sharp, B. M. H., and Bromley, D. W. 1978. *Agricultural Pollution, Methodological Issues and Policy Needs.* Madison, WI: University of Wisconsin, Department of Agricultural Economics.

Sherif, C. W.; Sherif, M.; and Nebergall, R. E. 1965. *Attitude and Attitude Change: The Social Judgment Involvement Approach.* Philadelphia, PA: Saunders.

Spiegel, H. B. C. 1971. Citizen participation in federal programs: a review. *J. Voluntary Action Research* 1:4-31.

Van Til, J., and Van Til, S. B. Citizen participation in social policy: end of cycle? *Social Problems* 17:313-23.

Weeks, S. B. 1970. Involving citizens in making public policy. *J. Extension* 8:40-45.

Wilson, J. Q. 1963. Planning and politics: citizen participation in urban renewal. *J. Am. Instit. Planners* 29:242-49.

Zurcher, L. A., Jr. 1970. The poverty board: some consequences of "maximum feasible participation." *J. Social Issues* 26:85-107.